REMARKS

The Office Action dated March 6, 2008 and the Advisory Action dated June 26, 2008 have been received and carefully noted. The following remarks are submitted as a full and complete response thereto.

The Advisory Action indicated that Applicant amended claim 1 by adding limitations of claims 2-4 and 13, 19, 20, 22, and 23, by adding similar limitations of claim 2-4 in the Response filed on April 4, 2008 ("Previous Response"). The Advisory Action further indicated that the examiner rejected claim 3 under 35 U.S.C. § 103(a) as being unpatentable over Wynn, and further in view of Su. The Advisory Action further indicated that Applicant has argued amended claims in respect to Wynn only.

The cited reference of Su will be discussed in this Supplemental Response. Thus, Applicants respectfully request that the Examiner consider the remarks in this Supplemental Response, as well as the remarks in the Previous Response.

Claim 1, upon which claims 5-12 are dependent recites a method, which includes receiving a speech signal including voice signals and background signals, and detecting voice activity and providing an indicator when no voice activity is detected. The method further includes encoding the speech signal to generate a plurality of parameters representing the signal, the plurality of parameters comprising a linear prediction calculation vector of quantized linear prediction filter coefficients, a gain parameter based on open-loop lag value, and a residual vector. The method further includes, when the

indicator is not present, outputting a first parametric representation of the speech signal comprising the plurality of parameters, and, when the indicator is present, modifying at least one of the plurality of parameters and outputting a second parametric representation of the speech signal including the modified parameter.

Claim 13, upon which claims 14-17 are dependent, recites an apparatus, which includes an input configured to receive a speech signal including voice signals and background signals, and a voice activity detector configured to detect voice activity and to provide an indicator when no voice activity is detected, and an encoder configured to encode the speech signal to generate a plurality of parameters representing the signal, the plurality of parameters comprising a linear prediction calculation vector of quantized linear prediction filter coefficients, a gain parameter based on open-loop lag value, and a residual vector. The apparatus further includes modifying circuitry configured to modify, when the indicator is present, at least one parameter of the plurality of parameter. The apparatus further includes an output configured to output a first parametric representation of the speech signal when the indicator is not present, the first parametric representation comprising the plurality of parameters, and configured to output a second parametric representation of the speech signal when the indicator is present, the second parametric representation comprising the modified parameter.

Claim 18 recites an apparatus, which includes receiving means for receiving a speech signal including voice signals and background signals, and detecting means for detecting voice activity and providing an indicator when no voice activity is detected.

The apparatus further includes encoding means for encoding the speech signal to generate a plurality of parameters representing the signal, the plurality of parameters comprising a linear prediction calculation vector of quantized linear prediction filter coefficients, a gain parameter based on open-loop lag value, and a residual vector, and outputting means for, when said indicator is not present, outputting a first parametric representation of the speech signal comprising said plurality of parameters, and, when the indicator is present, modifying at least one of the parameters and outputting a second parametric representation of the speech signal including the modified parameter.

Claim 20, upon which claim 21 is dependent, recites a network entity, which includes an input configured to receive a speech signal including voice signals and background signals, and a voice activity detector configured to detect voice activity and to provide an indicator when no voice activity is detected. The network entity further includes an encoder configured to encode the speech signal to generate a plurality of parameters representing the signal, the plurality of parameters comprising a linear prediction calculation vector of quantized linear prediction filter coefficients, a gain parameter based on open-loop lag value, and a residual vector, and modifying circuitry configured to modify, when the indicator is present, at least one parameter of the plurality of parameters, and an output configured to output a first parametric representation of the speech signal when the indicator is not present, the first parametric representation comprising the plurality of parameters, and configured to output a second parametric

representation of the speech signal when the indicator is present, the second parametric representation comprising the modified parameter.

Claim 22 recites a computer program comprising a code sequence which, when executed on a computer, encodes speech by implementing a method. The method includes receiving a speech signal including voice signals and background signals, and detecting voice activity and providing an indicator when no voice activity is detected. The method includes encoding the speech signal to generate a plurality of parameters representing the signal, the plurality of parameters comprising a linear prediction calculation vector of quantized linear prediction filter coefficients, a gain parameter based on open-loop lag value, and a residual vector. The method includes when the indicator is not present, outputting a first parametric representation of the speech signal comprising the plurality of parameters, and, when the indicator is present, modifying at least one of the plurality of parameters and outputting a second parametric representation of the speech signal including the modified parameter.

Claim 23 recites a system, which includes an input unit configured to receive a speech signal including voice signals and background signals, and a voice activity detector configured to detect voice activity and to provide an indicator when no voice activity is detected. The system further includes an encoder configured to encode the speech signal to generate a plurality of parameters representing the signal, the plurality of parameters comprising a linear prediction calculation vector of quantized linear prediction filter coefficients, a gain parameter based on open-loop lag value, and a

residual vector, and a modifying unit configured to modify, when the indicator is present at least one of the parameters. The method further includes an output unit configured to output, when the indicator is not present, a first parametric representation comprising said plurality of parameters, and to output a second parametric representation of the speech signal when the indicator is present, the second parametric representation comprising the modified parameter.

Thus, according to embodiments of the present invention, the modification of the parameters of a digital speech signal has an effect of smoothing background noise in the parameterized digital speech signal. Furthermore, according to embodiments of the present invention, the effect of smoothing background noise increases the overall speech quality of the digital speech signal.

As will be discussed below, Su fails to disclose or suggest all of the elements of the claims, and therefore fails to provide the advantages and features discussed above.

Su generally discloses that a multi-rate speech codec supports a plurality of encoding bit rate modes by adaptively selecting encoding bit rate modes to match communication channel restrictions. In higher bit rate encoding modes, an accurate representation of speech through CELP (code excited linear prediction) and other associated modeling parameters are generated for higher quality decoding and reproduction. For each bit rate mode selected, pluralities of fixed or innovation subcodebooks are selected for use in generating innovation vectors. The speech coder distinguishes various voice signals as a function of their voice content. For example, a

Voice Activity Detection (VAD) algorithm selects an appropriate coding scheme depending on whether the speech signal includes active or inactive speech. The encoder may consider varying characteristics of the speech signal including sharpness, a delay correlation, a zero-crossing rate, and a residual energy. Su further discloses that code excited linear prediction is used for voice active signals whereas random excitation is used for voice inactive signals; the energy level and spectral content of the voice inactive signal may also be used for noise coding. (see Su at Abstract).

Applicants respectfully submit that Su fails to disclose, teach, or suggest, all of the elements of the present claims. For example, Su fails to disclose, teach, or suggest, at least, "encoding the speech signal to generate a plurality of parameters representing the signal, the plurality of parameters comprising a linear prediction calculation vector of quantized linear prediction filter coefficients, a gain parameter based on open-loop lag value, and a residual vector," and "when the indicator is not present, outputting a first parametric representation of the speech signal comprising the plurality of parameters, and, when the indicator is present, modifying at least one of the plurality of parameters and outputting a second parametric representation of the speech signal including the modified parameter," as recited in claim 1, and similarly recited in claims 13, 18, 22, and 23.

As discussed above, Su discloses an encoding system which performs speech and channel encoding and delivers resultant speech information to a channel. Su further discloses that a closed-loop pitch analysis is performed to find a pitch lag and gain, by

searching around the open-loop pitch lag. (see Su at col. 10, lines 9-15). However, Su fails to disclose, or suggest, generating a linear prediction calculation vector of quantized linear prediction filter coefficients or a residual vector. Furthermore, Su fails to disclose, or suggest, modifying at least one of the plurality of parameters and outputting a second parametric representation of the speech signal including the modified parameter, when an indicator is present. In fact, there is no disclosure, or suggestion, of an indicator or modifying any of the encoded parameters.

As discussed in the Previous Response, Wynn fails to disclose, or suggest, all of the elements of independent claims 1, 13, 18, and 22-23, because Wynn fails to disclose, or suggest, "encoding the speech signal to generate a plurality of parameters representing the signal, the plurality of parameters comprising a linear prediction calculation vector of quantized linear prediction filter coefficients, a gain parameter based on open-loop lag value, and a residual vector," and "when the indicator is not present, outputting a first parametric representation of the speech signal comprising the plurality of parameters, and, when the indicator is present, modifying at least one of the plurality of parameters and outputting a second parametric representation of the speech signal including the modified parameter," as recited in claim 1, and similarly recited in claims 13, 18, 22, and 23.

As previously discussed, Wynn fails to disclose or suggest encoding a speech signal using a plurality of parameters, comprising a linear prediction calculation vector of quantized linear prediction filter coefficients, a gain parameter based on open-loop lag

value, and a residual vector. The Office Action took the position that Wynn discloses a linear prediction calculation vector of quantized linear prediction filter coefficients at col. 5, lines 13-31. However, this cited portion of Wynn merely discloses two types of constraints which are applied at each iteration of a signal estimator: a LPC Autocorrelation matrix relaxation constraint and interframe smoothing of a current frame's LPC speech model pole positions. (see Wynn at col. 5, lines 13-31). Neither of these constraints constitute a linear prediction calculation vector of quantized linear prediction filter coefficients.

Furthermore, the Office Action took the position that Wynn discloses a residual vector at col. 7, lines 1-5. However, this cited portion of Wynn merely discloses that the combining of features of two signal-modeled iterative algorithms has been found to result in a les muffled sounding speech estimate. (see Wynn at col. 7, lines 1-5). There is no disclosure, or suggestion, of a vector, let alone a residual vector.

For at least the reasons discussed above, Su fails to cure the deficiencies in Wynn. Thus, for at least the reasons discussed above, the combination of Wynn and Su fails to disclose, or suggest, all the elements of independent claims 1, 13, 18, and 22-23. For the reasons stated above, Applicants respectfully request that this rejection be withdrawn.

Claims 5-12 depend upon claim 1. Claims 14-17 depend upon claim 13. Claim 21 depends upon claim 20. Thus, Applicants respectfully submit that claims 5-12, 14-17, and 21 should be allowed for at least their dependence upon claims 1, 13, and 20, respectively, and for the specific elements recited therein.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

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Enclosures: RCE
Petition for Extension of Time
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